

# TECHNICAL MEMORANDUM

## Utah Coal Regulatory Program

---

August 10, 2010

TO: Internal File

THRU: James D. Smith, Permit Supervisor *JS 8/16/10*

FROM: April A. Abate, Environmental Scientist II *AAA 8-16-2010*

RE: Water Monitoring Amendment, Bear Canyon Mine, C/015/0025 Task ID #3591

### SUMMARY

An updated version of the water-monitoring plan was submitted to the Division of Oil, Gas and Mining (the Division) by Norwest Corporation, the consultant for the Trustee of the Bear Canyon mine. At the present time, the mine is in the process of being sold and a new owner, Rhino Energy is preparing to resume operations. Norwest Corporation is expected to be retained by Rhino Energy to conduct and manage the water sampling program.

The updated water-monitoring plan is intended to present a more streamlined plan that is consistent with future mining activities once the mine resumes operations. The plan proposes to reduce several sampling stations to more accurately reflect current surface disturbance and underground mining locations. In addition, the amendment presents a statistical analysis of the baseline analytes that have historically been sampled for to support which water quality parameters are relevant to continue sampling for based on their historical concentrations and detection occurrences.

The plan proposes to reduce the sampling stations from 45 to 19, most of which are spring and stream sites that are in areas where mine leases have not yet been initiated. The plan proposes to reinstate these sampling sites once mining begins or resumes in these areas. The plan also introduces an "expanded list" of parameters to sample for, which has fewer analytes than what was listed in the "baseline" parameter list. The revised list eliminates analytes that have infrequent and low detection rates. This was the case for many of the trace metals.

---

TECHNICAL MEMO

---

**Findings:**

The water-monitoring amendment should be resubmitted noting the following deficiencies and recommendations:

**[R645-301-120]:** The narrative section of the Mine Reclamation Plan discussing the water monitoring plan begins on page 7-48 and ends on page 7-60. The applicant did not submit any text revisions for the narrative section of the plan. This section will need to be updated to reflect the approved revisions. In addition, the applicant submitted Tables 1, 2 and 3 as supplemental material that were intended to show rationale for proposing deactivating and reactivating sampling sites and statistical evaluations of the sample locations. The applicant did not appear to intend to include them as part of the final MRP; however the Division would like that they incorporate them into the mine plan such that the rationale for reactivating the sampling locations is clearly illustrated.

**[R645-301-731.210]:**

- Monitoring well MW-117 was proposed for deactivation until such time that mining resumes/begins in the area. Based on the recent trend in water level data showing a significant rise in water levels, continued gauging MW-117 for water levels is necessary.
- SBC-3 is set in the alluvium in a creek adjacent to stream sample BC-3 at the margin of the disturbed area. Because the well is set in the alluvium, the groundwater system has the potential for contact with the disturbed area. Therefore, it is important that this site continue to be sampled for operational water quality parameters.
- The applicant has structured their plan to reactive the sampling locations when it is determined that mining in these specific areas either begins or resumes. The best way to track this is for the applicant to provide a commitment to the Division in Bear Canyon Annual Report to evaluate the mine plan each year and notify the Division of which water monitoring points will be activated based on the forecast for underground mining. It is suggested that the applicant commit to re-establish monitoring of the sites a minimum of one year prior to mining activity resuming in the area.
- The Division recommends re-evaluating the monitoring of two spring samples SBC-4 and SBC-9A quarterly for dissolved and total lead. There were no statistical data to justify the reason for lead sampling at either of these sites.

**[R645-301-731]:** The applicant did not submit a revised map of the water monitoring locations. Please submit a current version of Plate 7-4 showing spring SBC-23 as historical monitoring site as well as any other relevant updates to the map. The Division also recommends that updated mine plans shown in Plates 5-1A, 5-1B, and 5-1C be submitted also – these maps can be submitted separately and not necessarily need to be submitted concurrent with this water monitoring plan amendment.

## GENERAL CONTENTS

### PERMIT APPLICATION FORMAT AND CONTENTS

Regulatory Reference: 30 CFR 777.11; R645-301-120.

#### Analysis:

The application as submitted included revised Tables 7-12 through 7-17. These tables represent a compilation of the groundwater and surface water monitoring locations as well as the required sampling parameters that make up the water monitoring program. Table 7-15 is a listing of past monitoring sites for historical reference. The submittal also included supplemental tables that were intended to show rationale for proposing deactivating and reactivating sampling sites when conditions warrant it and statistical evaluations of the sample locations. The applicant did not appear to intend to include them as part of the final MRP; however the Division would like that they incorporate them into the mine plan such that the rationale for proposing to eliminate the samples is clearly illustrated.

The narrative section of the MRP discussing the water monitoring plan begins on page 7-48 and ends on page 7-60. The applicant did not submit any text revisions for the narrative section of the plan.

#### Findings:

Upon review of pages 7-48 through the beginning of page 7-60 of the MRP, there are areas where the information presented is outdated or no longer applicable. Upon inserting the modified water-monitoring plan into the MRP, the Permittee should revise the narrative sections, delete and/or edit language that no longer applies. In addition, the Division recommends that the applicant submit the supplemental Tables 1 through 3 that were used to justify the modifications to the sampling plan such that it is clear to the reader of the MRP how the modifications to the sampling plan were arrived at.

The requirements for Permit Application Format and Contents as provided in R645-301-120 have not been met.

---

TECHNICAL MEMO

---

## OPERATION PLAN

### HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

#### Analysis:

##### **Proposed Reduction in Stream Site Monitoring**

According to Table 1 submitted by the applicant, 9 out of 16 stream monitoring stations are proposed for reduction. Each of these wells are set in the Star Point sandstone. These sites will be decommissioned until such time that mining resumes/begins in their respective areas. Two stream sites Lower and Upper McCadden Hollow Creek (Sample Ids: MH-1 and MH-2) are being removed based on no mining until Federal leases U-46484 and U-024316 are initiated. According to Plate 5-1A in the MRP, the Blind Seam workings are within those lease areas and are forecasted to be mined in 2014, 2016-2018. Stream sites in the Fish Creek area (Sample Ids: FC-2, FC-3, FC-4, FC-5, FC-6, FC-7 and FC-8) are being removed based on no mining taking place in T16N R8E, Sections 7, 17, 18, 19, 20. According to Plates 5-1A, 5-1B, and 5-1C, the Blind Seam, Hiawatha Seam and the Tank Seams were all forecasted for mining between 2007 and 2014.

The Division has no objections with these sites being decommissioned until such time that mining resumes/begins in these areas.

##### **Proposed Reduction in Spring Site Monitoring**

According to Table 1 submitted by the applicant, 13 out of 24 spring monitoring stations are proposed for reduction. These sites will be decommissioned until such time that mining resumes/begins in their respective areas. A spring along Wild Horse Ridge (SBC-18) as well as the Upper Left Fork of Fish Creek (Springs SBC-20 and SBC-21) and SBC-22, SCC-1, SCC-2, SCC-5 are to be decommissioned until such time that "mining resumes in Mine #4 or mining from the Mohrland area is within 500 feet of the springs". These springs are all located in Sections 7, 13, 17 and 18 of T16N R8E. According to Plate 5-B and 5-C, the Hiawatha and Tank seams in these locations are to be mined between 2009 and 2014.

## TECHNICAL MEMO

---

Five spring sites (SMH-1, SMH-2, SMH-3, SMH-4,) located in the Lower and Upper McCadden Hollow Creek area are being removed based on no mining until Federal leases U-46484 and U-024316 are initiated. According to Plate 5-1A in the MRP, the Blind Seam workings are within those lease areas and are forecasted to be mined in 2014, 2016-2018. Spring SMH-5 – a stockwater trough in McCadden Hollow will be reactivated pending the construction of a new portal if access to Federal lease #s U-61048 and U-61049 is granted.

The Division has no objections with these sites being decommissioned until such time that mining resumes/begins in these areas.

### **Proposed Reduction in Well Site Monitoring**

There are four active wells currently being gauged for water level only (SDH-2, SDH-3, MW-114 and MW-117). The applicant is proposing to deactivate gauging at wells SDH-2, SDH-3 and MW-117 until such time that mining begins/resumes at the Federal lease sites or in the Mohrland area. The applicant proposes to continue gauging water levels in MW-114. According to the Probable Hydrologic Consequences (PHC) prepared by Mayo and Associates, June 2001 (page 103), groundwater from the Spring Canyon member of the Star Point sandstone is hydraulically isolated from the surface and minimal potential exists for groundwater quality to be impacted; therefore water quality measurements were not recommended on wells set in the Star Point Sandstone.

Generally, the Division agrees with the proposed well reduction plan with the exceptions of MW-117 and SBC-3. MW-117 is located in Section 12 T16S, R8E and is also known as the Mohrland #17 well. This well has exhibited a rise in water levels approximately 500 feet beginning in May 2009 (see table below). This rise in water level may require additional investigation and certainly continued monitoring.

SITE NAME	SITE DESCRIPTION	DATE	Depth Feet
MW-117	Mohrland Well #17	9/30/2009	1272
MW-117	Mohrland Well #17	8/11/2009	1274
MW-117	Mohrland Well #17	7/13/2009	1452
MW-117	Mohrland Well #17	5/27/2009	1464
MW-117	Mohrland Well #17	10/23/2008	1782
MW-117	Mohrland Well #17	9/19/2008	1782
MW-117	Mohrland Well #17	7/11/2008	1783
MW-117	Mohrland Well #17	6/3/2008	1781
MW-117	Mohrland Well #17	10/17/2007	1783
MW-117	Mohrland Well #17	9/15/2007	1783
MW-117	Mohrland Well #17	8/28/2007	1783
MW-117	Mohrland Well #17	7/23/2007	1776

---

TECHNICAL MEMO

---

MW-117	Mohrland Well #17	6/26/2007	1779
MW-117	Mohrland Well #17	10/24/2006	1778
MW-117	Mohrland Well #17	9/26/2006	1779
MW-117	Mohrland Well #17	8/23/2006	1779
MW-117	Mohrland Well #17	7/29/2006	1760
MW-117	Mohrland Well #17	6/29/2006	1778
MW-117	Mohrland Well #17	10/27/2005	1776
MW-117	Mohrland Well #17	9/20/2005	1776
MW-117	Mohrland Well #17	8/26/2005	1776
MW-117	Mohrland Well #17	7/7/2005	1774
MW-117	Mohrland Well #17	6/27/2005	1774

The applicant lists SBC-3 as a Creek Well. This well is located adjacent to stream sample BC-3 at the margin of the disturbed area. Although listed as a well, the Division has been monitoring this site for operational parameters as a spring. Because the well is set in the alluvium in the creek, the groundwater system has the potential for contact with the disturbed area. Therefore, it is important that this site continue to be sampled for operational water quality parameters.

### **Elimination of Spring SBC-23**

One spring site SBC-23 has been proposed for elimination. This spring is listed as a spring that has shown no flow since 2007 that is now part a stabilized landslide, according to the applicant. Based on the PHC prepared by Mayo and Associates (Investigation of Groundwater and Surface Water Systems in the C.W. Mining Company June 2001), this spring, as well as Spring SBC-12, located less than 500 feet to the west of Spring SBC-23, both originate at the contact between the Flagstaff Limestone and the North Horn Formation. Therefore, sampling SBC-12 will adequately monitor the groundwater derived from springs originating from this stratum once mining of the Mohrland area begins.

The Division has no objection to this spring being eliminated from the water monitoring plan.

### **Reduction in Water Quality Parameters**

The applicant has submitted Table 2, which provides a statistical analysis of the parameters that have historically been less than detection limits, or below state water quality criteria. The results indicated that several trace metals and other analytes fall under this criteria including: aluminum, arsenic, carbonate (CO<sub>3</sub>), cadmium, copper, lead, molybdenum, nitrogen, ammonia, nitrite, nitrate, phosphate, and zinc. As a result, these analytes have been eliminated from the list of "expanded parameters" which represents a list derived from the original baseline

TECHNICAL MEMO

---

analytes that were originally sampled for during the baseline assessment. The expanded parameter list represents the list of parameters that going forward, will be sampled for during the year preceding repermitting.

According to the Utah Department of Water Quality's 2004 303 (d) List of Impaired Waters, the Huntington Creek Watershed is listed as impaired for salinity, total dissolved solids (TDS), and chlorides. Salinity, TDS, and chloride are listed as required analytes to sample for in the revised water monitoring plan and therefore there is no concern with any proposed reduction of analytes that have a potential to impacted a total maximum daily load (TMDL) impaired watershed.

Two spring samples SBC-4 and SBC-9A have been monitored quarterly for dissolved and total lead as specified in the MRP on page 7-49. There were no statistical data to justify the reason for lead sampling at either of these sites. There was a trace detection in 2005 but it appeared to be an isolated event. The Division recommends re-evaluating the total lead requirement for these sampling stations in the water monitoring plan.

**Findings:**

The application meets the hydrology Operation Plan requirements for surface water monitoring as provided in R645-301-731.220. The Division finds that these standards are met because the proposed surface water monitoring plan is based upon previous PHC determinations, previous monitoring plans as well on assessments of monitoring data collected to date. In addition, the proposed monitoring plan takes into consideration past and future mining activity.

The application meets the hydrology Operation Plan requirements for groundwater monitoring as provided in R645-301-731.210 with some exceptions. The Division approves of the reduction of spring monitoring stations but some of the well site locations should continue to be monitored (see bulleted summary below) from the Permittee's water monitoring plan:

- Monitoring well MW-117 was proposed for deactivation until such time that mining resumes/begins in the area. Based on the recent trend in water level data showing an approximately rise in water levels, continued gauging MW-117 for water level is necessary.
- SBC-3 is set in the alluvium in a creek adjacent to stream sample BC-3 at the margin of the disturbed area. Because the well is set in the alluvium, the groundwater system has the potential for contact with the disturbed area. Therefore, it is important that this site continue to be sampled for operational water quality parameters.

---

**TECHNICAL MEMO**

---

- The applicant has structured their plan to reactive the sampling locations when it is determined that mining in these specific areas either begins or resumes. The best way to track this is for the applicant to provide a commitment to the Division in Bear Canyon Annual Report to evaluate the mine plan each year and notify the Division of which water monitoring points will be activated based on the forecast for underground mining. It is suggested that the applicant commit to re-establish monitoring of the sites a minimum of one year prior to mining activity resuming in the area.
- The Division recommends re-evaluating the monitoring of two spring samples SBC-4 and SBC-9A quarterly for dissolved and total lead. There were no statistical data to justify the reason for lead sampling at either of these sites.

## **MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS**

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

### **Analysis:**

The applicant did not submit a revised Plate 7-4 Water Monitoring location map. An updated map should be provided to the Division showing the discontinuation of Spring SBC-23 and any other updates to the map that the applicant feels are relevant. It should be noted that SBC-23 should still be demarcated as a historical monitoring location on the map.

Part of the evaluation of this amendment involved a review of the Hiawatha, Tank, and Blind Seam Working maps, which are listed as Plates 5-1A, 5-1B, and 5-1C in the MRP. Although not required for this submittal, but in light of the recent transition to new management, The Division recommends these mine workings plans be reevaluated and provided to the Division such that the most current mine plan forecast information is accurately reflected in the MRP.

### **Findings:**

The information provided does not meet the hydrologic requirements for Monitoring and Sampling Location Maps as provided in the R645-State of Utah Coal Mining Rules.

- The applicant did not submit a revised map of the water monitoring locations. Please submit a current version of Plate 7-4 showing spring SBC-23 as a historical monitoring site as well as any other relevant updates to the map. The Division also recommends that updated mine plans shown in Plates 5-1A, 5-1B, and 5-1C be submitted also – this can be submitted separately and does not



necessarily need to be submitted concurrent with this water monitoring plan amendment.

**RECOMMENDATIONS:**

The amendment is not recommended for approval at this time. Please review the outlined deficiencies and recommendations and resubmit the amendment.

O:\015025.BCN\FINAL\WG3591\3591.doc